Subdivision Rules & Regulations Updates: Proposals & Discussion

Topics:

- Measure 30’ minimum intersection rounding radius at pavement edge instead of edge of right of way
- Refine intersection separation rules

Intersection Radius

Minimum Rounding Radius Change to 30’ at Pavement Edge

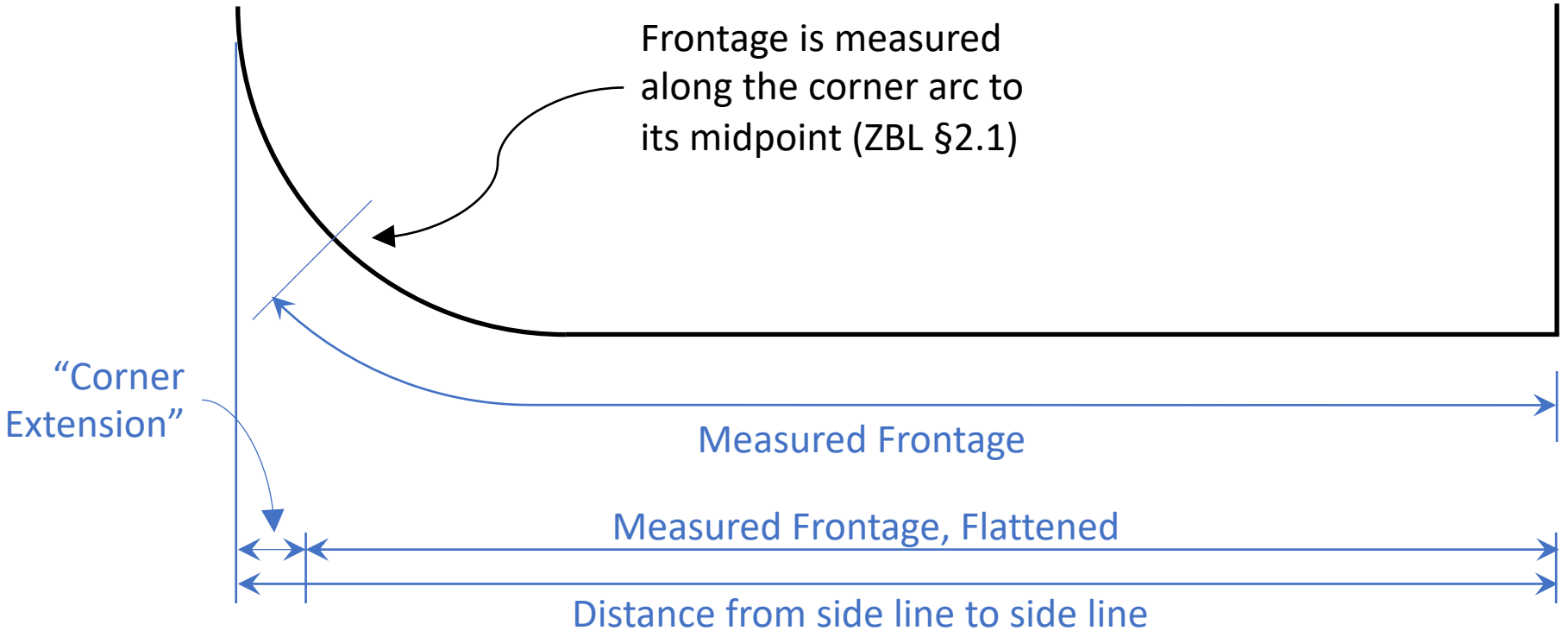
4.1.3.5 The edge of pavement at street intersections shall be rounded or cut back to provide for a radius of not less than thirty feet (30'). The edge of right of way at intersections shall be rounded or cut back to maintain the constant distance from the edge of pavement as specified by Section 4.1.3.7.

Why would we consider this? We currently require a minimum 30’ radius at the edge of right of way, but a 30’ radius at the edge of pavement is more or less always used, and is the visible boundary, so this would formalize it.

Questions:

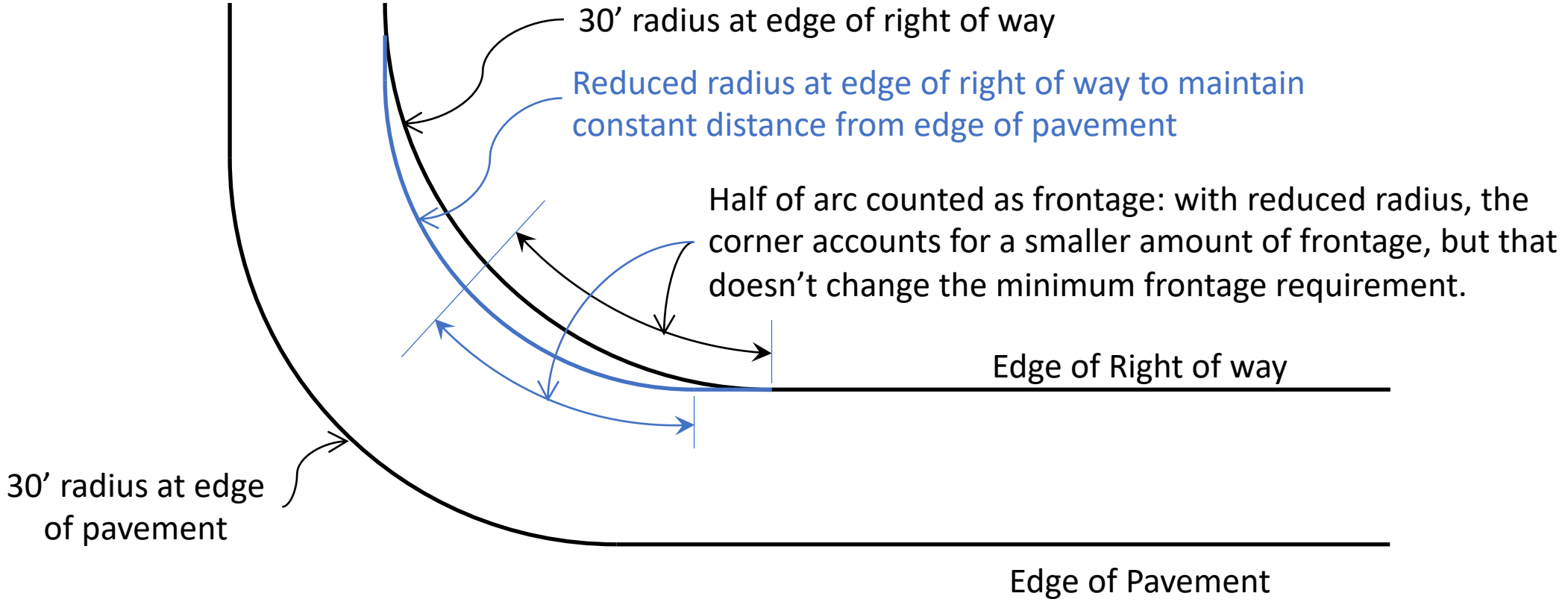
- What is the impact on lot frontage and spacing of intersections?
- What is the impact on the intersection of a new subdivision road with existing streets?

Measuring Frontage at a Corner



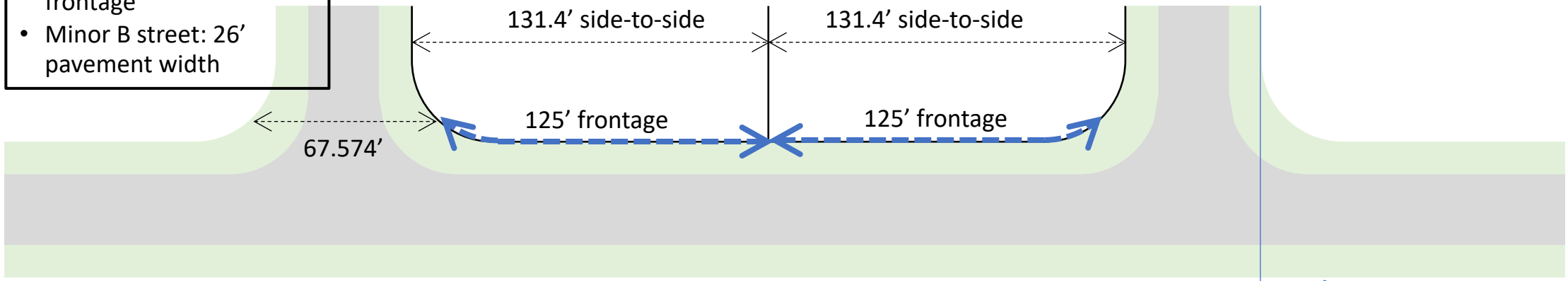
The minimum side-to-side measurement is greater than the minimum frontage. For the sake of discussion, let's call the difference the "corner extension" – its length depends upon the radius of the arc.

How Does Reduced Radius Affect Frontage?

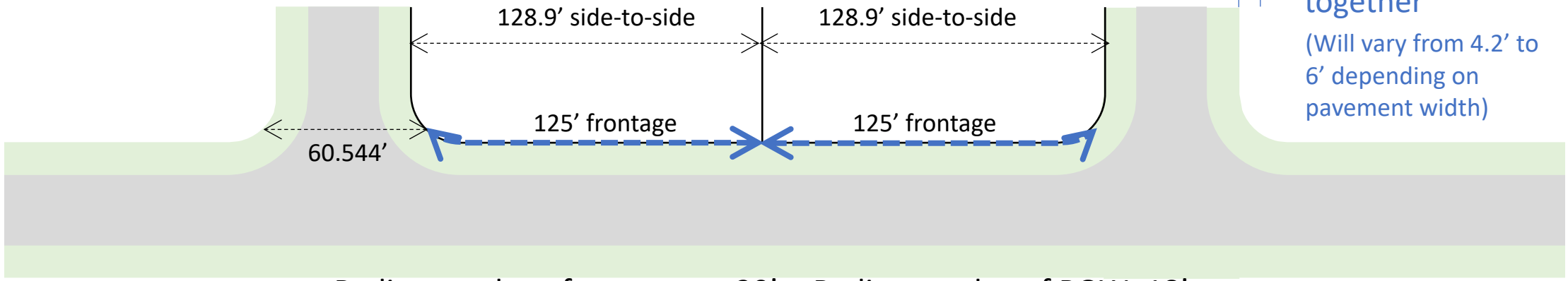


With the reduced radius at ROW line, how much more closely can we pack streets?

For this example:
- R20 zone: 125’ minimum frontage
- Minor B street: 26’ pavement width



Radius at edge of pavement: 30’ Radius at edge of ROW: 30’

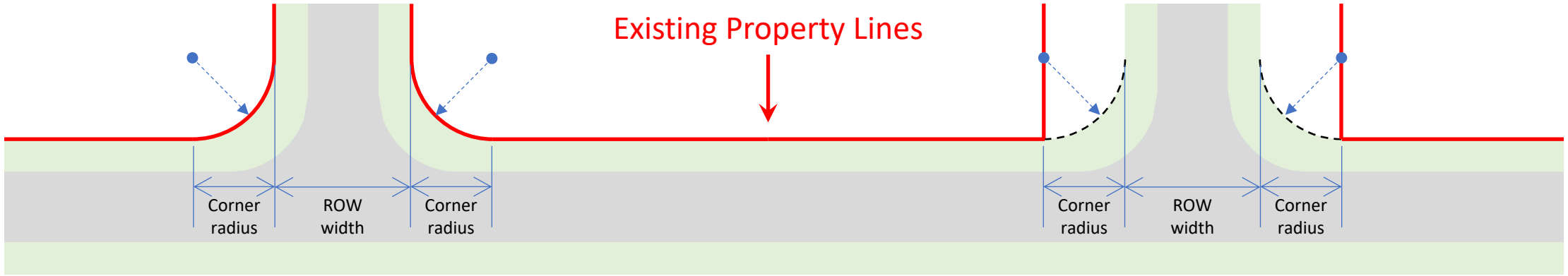


Radius at edge of pavement: 30’ Radius at edge of ROW: 18’

The two streets are 5 feet closer together

(Will vary from 4.2’ to 6’ depending on pavement width)

Intersection with Existing Street

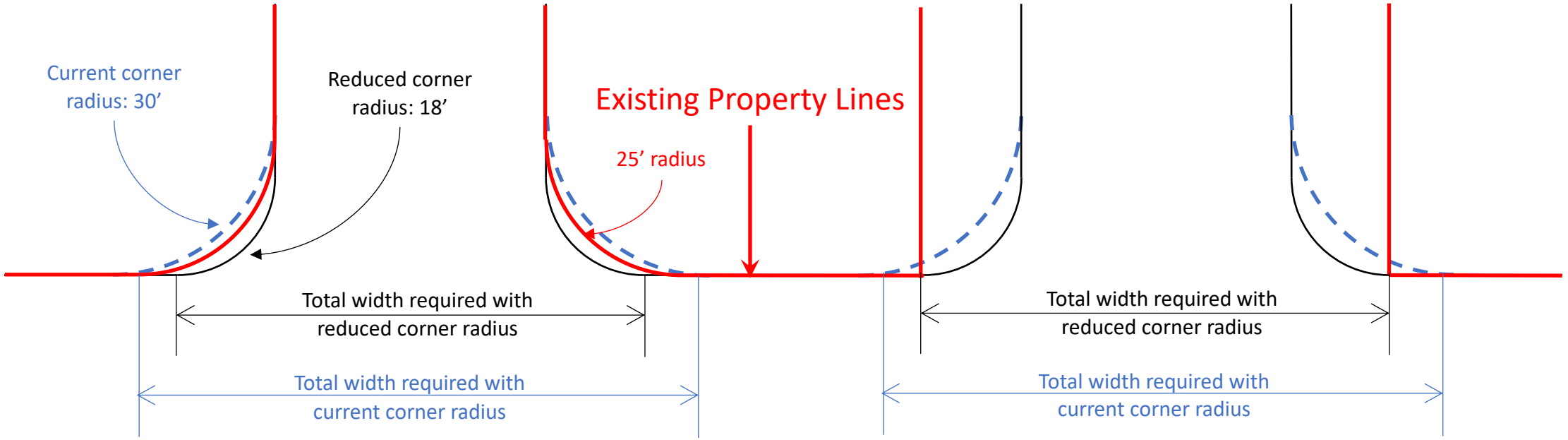


Minimum required rounding at edge of right of way must fit within existing property lines:

- Property lines may have been drawn to include roundings of the required radius
- Property lines may have been drawn far enough apart to accommodate roundings of the required radius

(Where existing property lines cannot accommodate a compliant intersection, acquisition of one or both adjoining properties, *if feasible*, could solve that problem.)

Effect of Reduced Corner Radius



Existing property lines that do not accommodate current 30’ corner radius may accommodate reduced corner radius

Could This Affect Any Place in Grafton?

- Using GIS, we identified lots with a potential subdivision road intersection having non-compliant frontage on an existing way that could become compliant with a reduced radius of 18’
  - Verified measurements via deeds (GIS measurements are imprecise)
  - No attempt to determine whether the lots were otherwise developable
- Two lots whose sole frontage is non-compliant but would become compliant with the reduced radius
  - 14 Apple Ridge Ln has 25’ roundings
  - 15 Institute Rd has one 25’ rounding and one 31’ rounding
- Two lots with one compliant frontage and one that is non-compliant but would become compliant with the reduced radius
  - 221 Brigham Hill Rd has one compliant frontage and one with 20’ roundings
  - 27 Valley View Dr has compliant frontage on Valley View Dr and 88’ of frontage on Adams Rd

Our Questions, Answered

- What is the impact on lot frontage and spacing of intersections?
  - Minimal
- What is the impact on the intersection of a new subdivision road with existing streets?
  - Significant: Four potential subdivision road intersections that could not comply with current rules would be able to comply with the revised rule
  - Caveat: A potential intersection that could not comply with current rules could become compliant with the acquisition of abutting property, although such acquisition may not be practical for a variety of reasons

Consider Alternatives for Intersection Radii

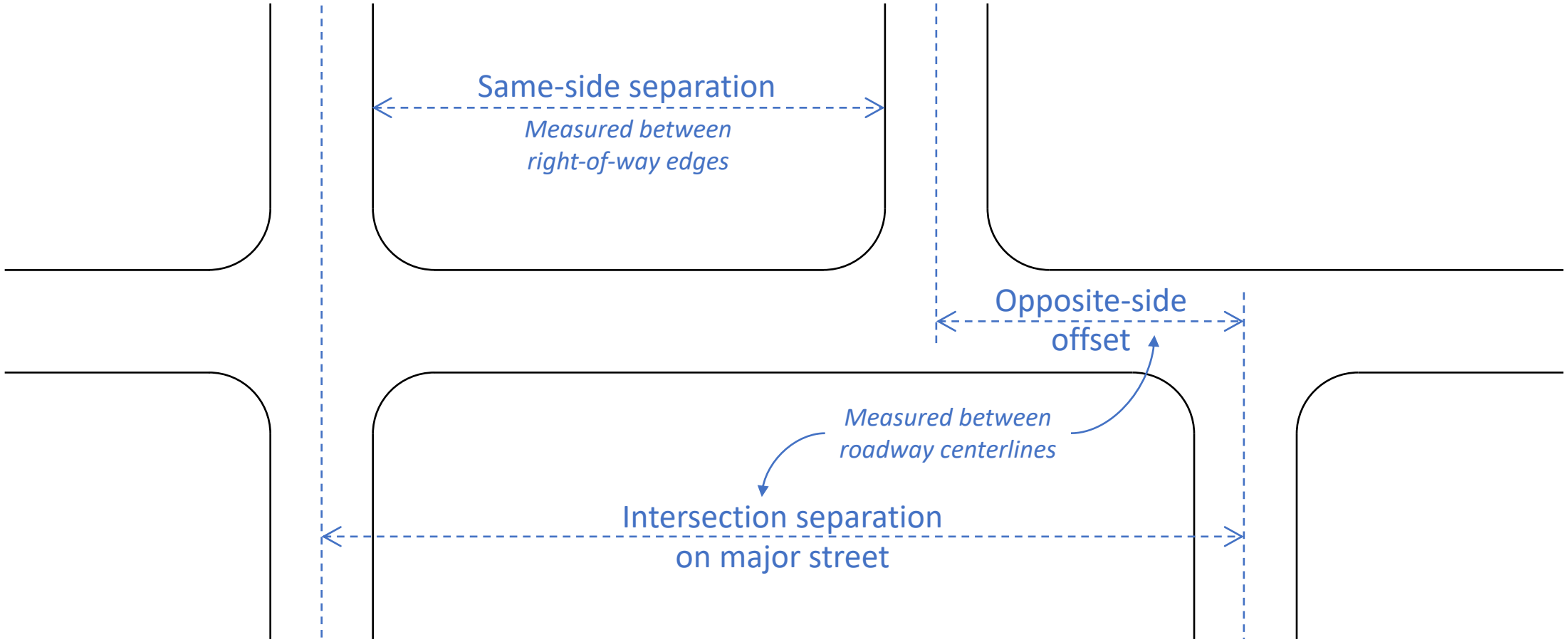
- What was proposed seemed like a good idea, on the assumption that it had no significant impact or unintended consequences
- To clear up ambiguities in the rules for property lines and pavement at intersections, we might:
  - Be more explicit about the radius at the edge of pavement (we currently say nothing explicitly, but implicitly require a radius greater than 30’); or
  - State explicitly that the constant distance between edge of pavement and edge of right of way does not apply at corners; or
  - Proceed with the proposed change, with the explicit understanding and acceptance that it makes four potential intersections newly compliant with the new rules

Intersection Separation

Key Factors that Influence Intersection Separation Rules

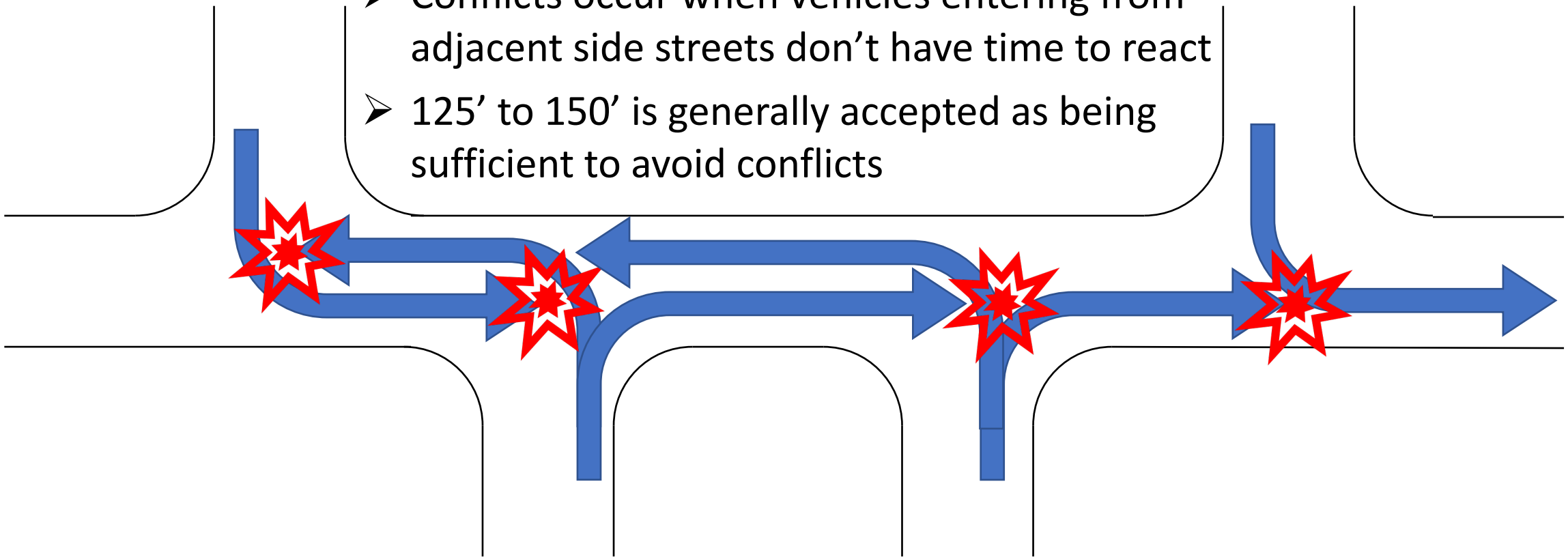
- Traffic conflicts between vehicles entering a street from two adjacent side streets
- Streets on three sides of a single lot
- Congestion at intersections on busy streets

Intersection Separation Measurements

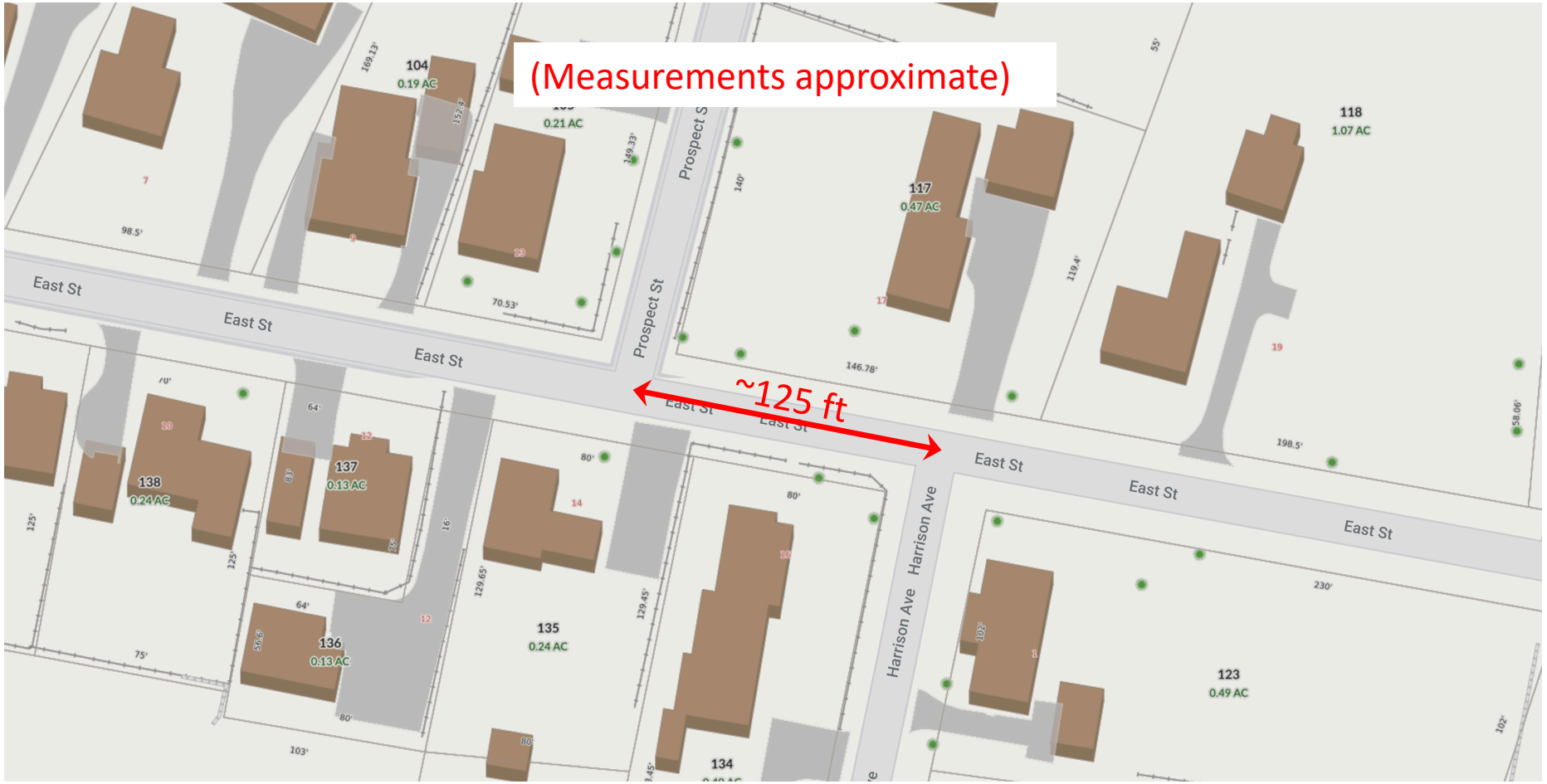


Traffic Conflicts

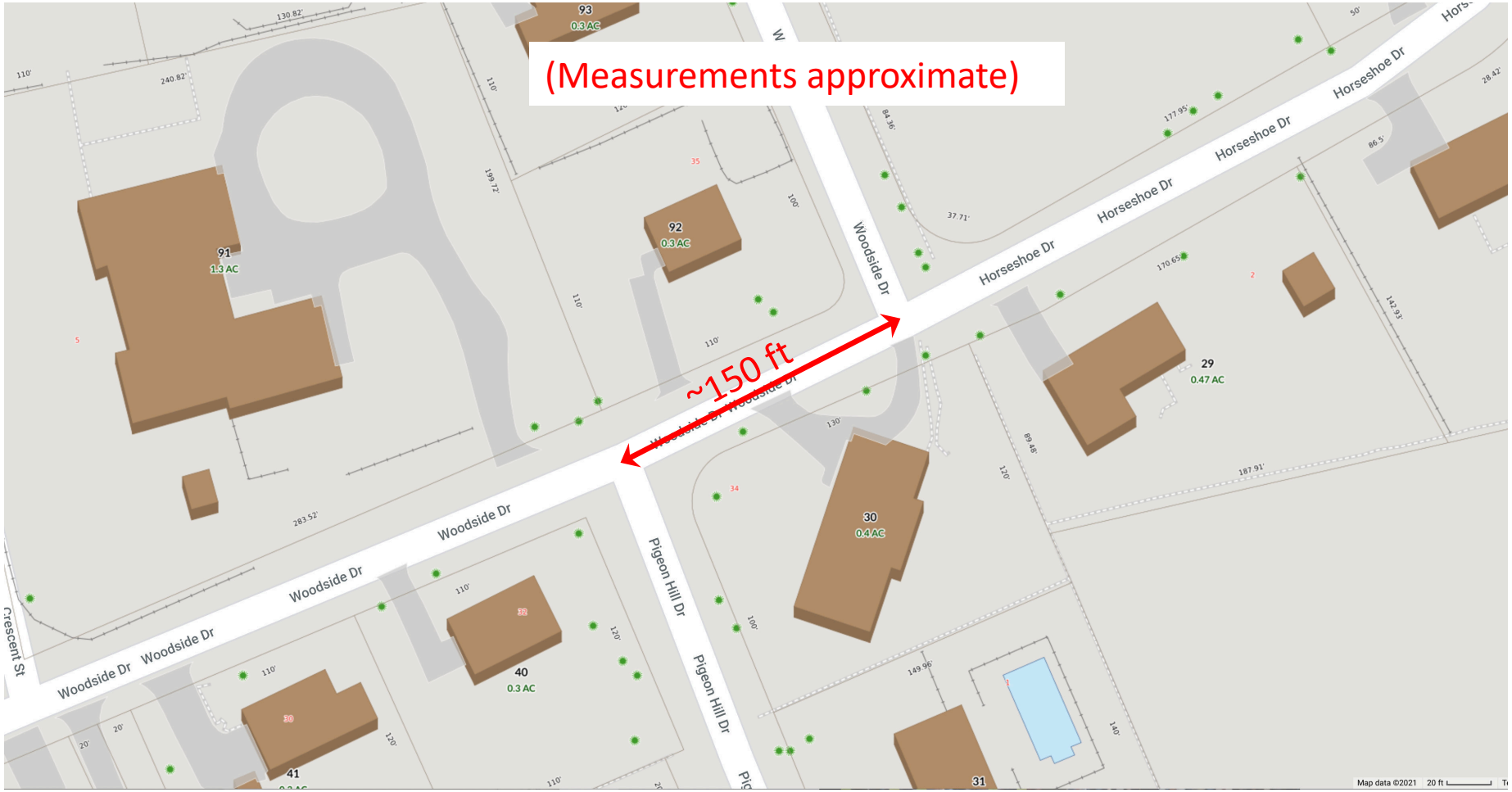
- Conflicts occur when vehicles entering from adjacent side streets don't have time to react
- 125' to 150' is generally accepted as being sufficient to avoid conflicts



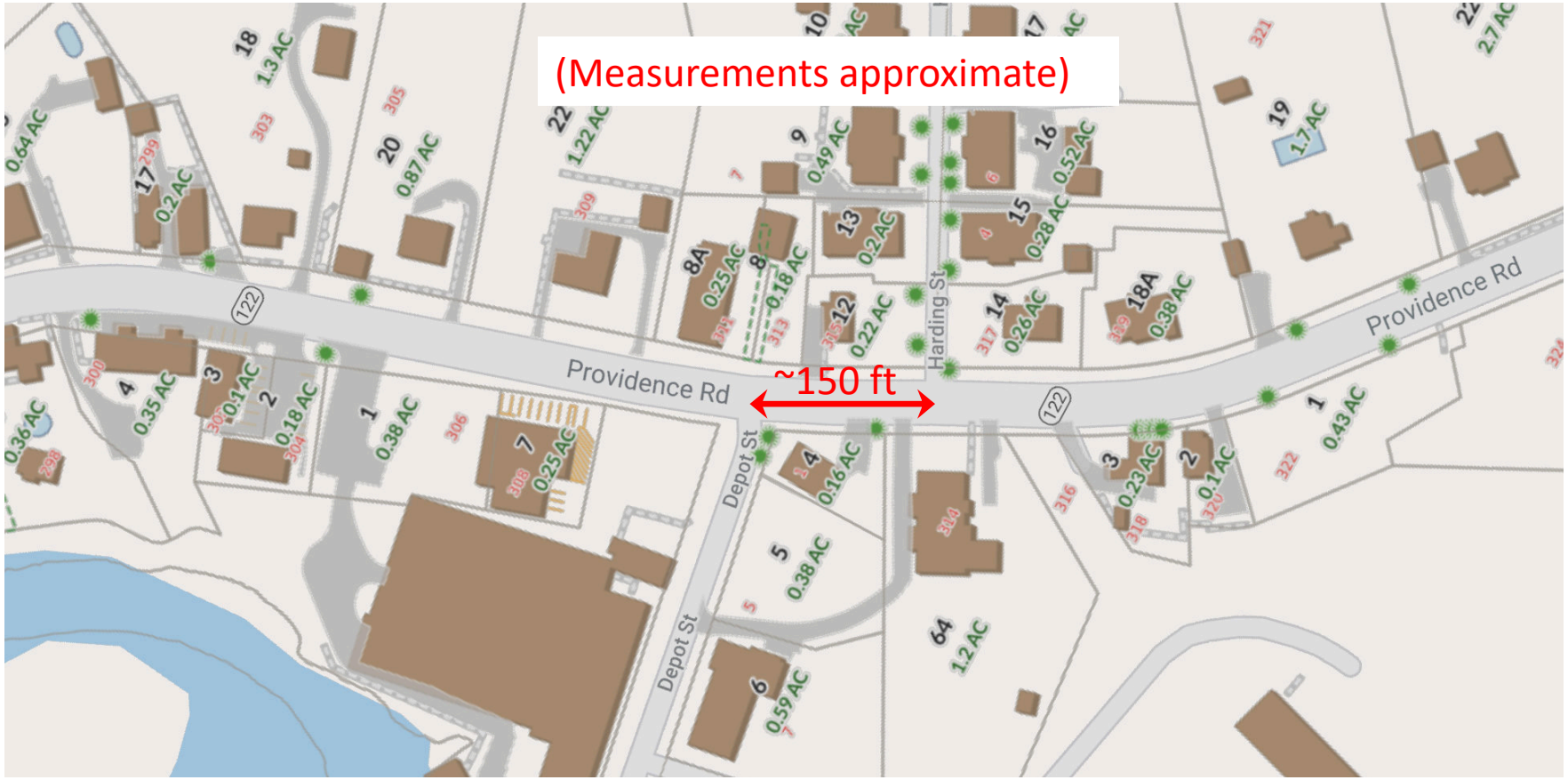
Opposite-Side Offset Example: East St between Prospect St and Harrison Ave



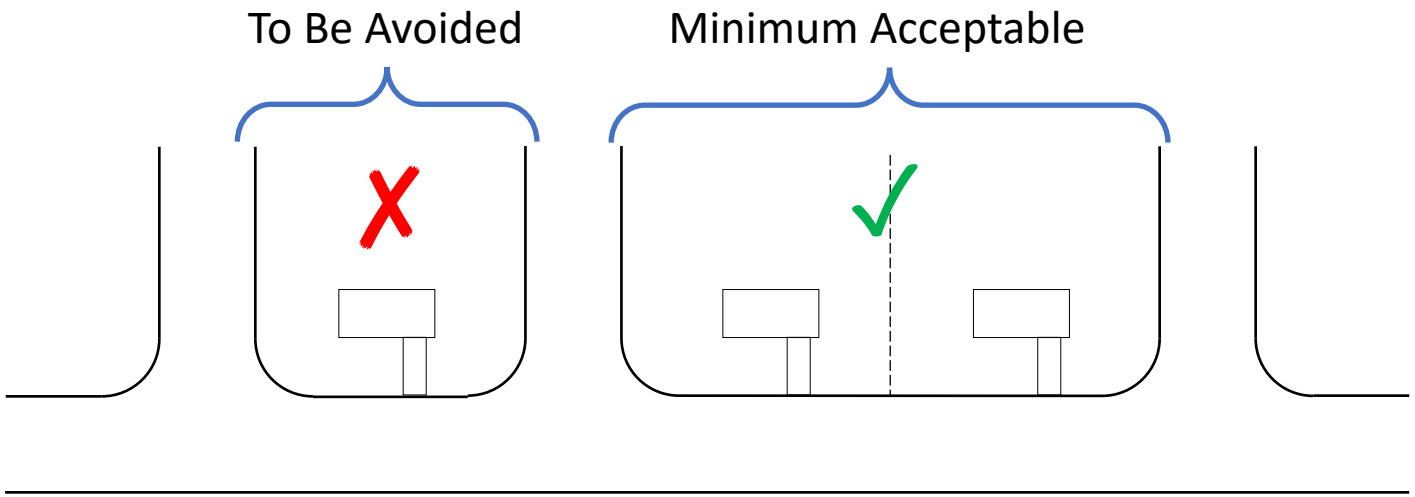
Opposite-Side Offset Example: Woodside Dr between Pigeon Hill Dr and Horseshoe Dr



Opposite-Side Offset Example: Providence Rd between Depot St and Harding St



Streets on Three Sides of a Lot



- A lot may be adversely impacted by having streets on three sides
  - For example, a lot developed for residential or commercial use with frontage not much more than the minimum frontage for its zoning district can reasonably be assumed to be adversely impacted by having streets on both side lines
- So – intersection rights of way should be separated by at least twice the minimum lot frontage for the zone

Streets on Three Sides of a Lot: Details

- There is a minimum acceptable intersection separation
  - Where the minimum frontage is small, e.g., 100', twice the minimum frontage may be too short for comfort
  - Something like 250' or 300' is a minimum acceptable separation
  - The rule should be the greater of (1) twice the minimum frontage or (2) the minimum acceptable separation
- We won't require that there actually be two lots between streets
  - A single lot can have twice the minimum frontage between two streets, in which case it is unlikely to be adversely impacted by streets on three sides

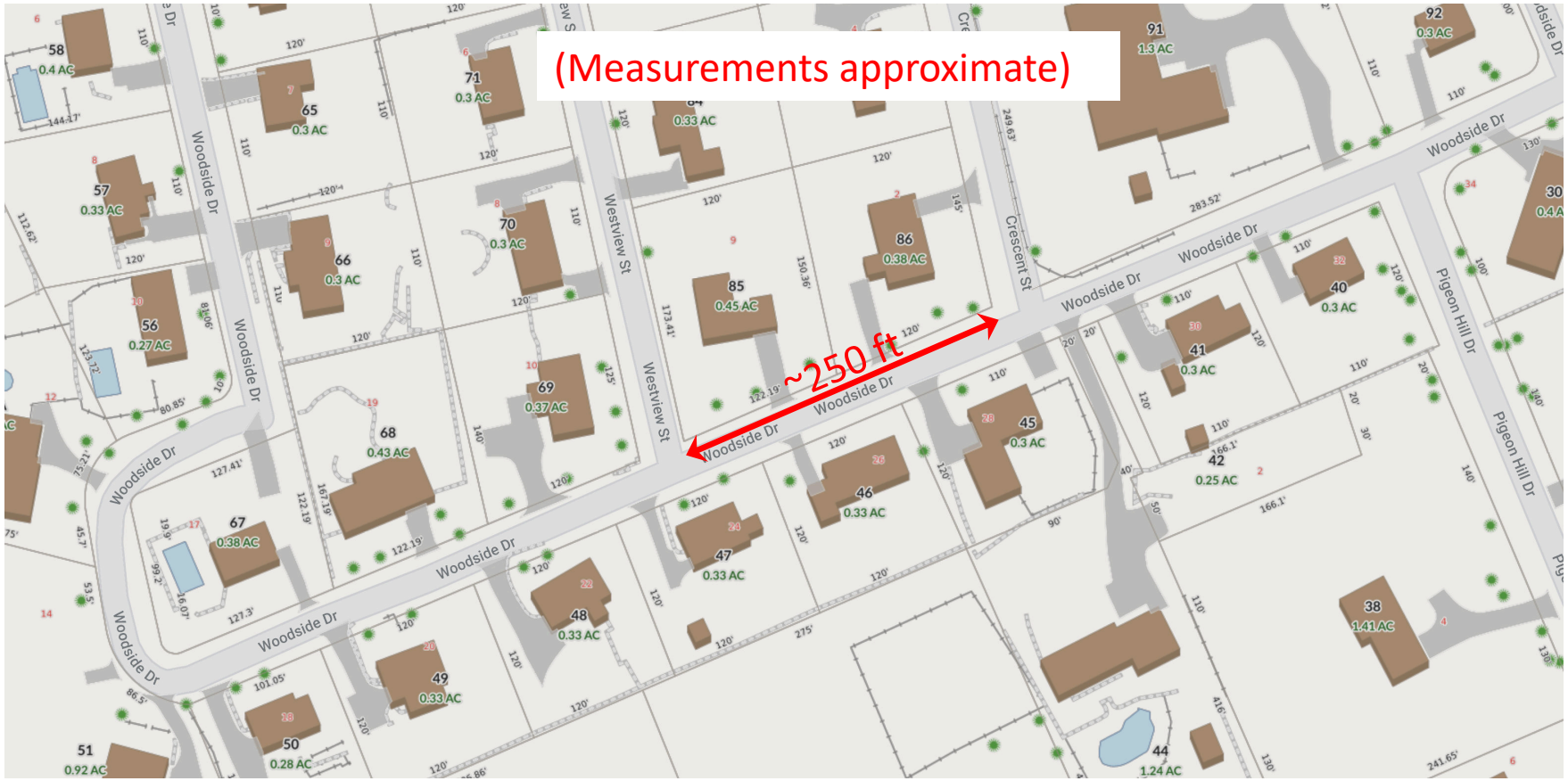
Streets on Three Sides of a Lot: Exceptions

- There may be situations where a separation less than the prescribed minimum can be allowed by waiver of the rule
- When strict compliance is not feasible due to one or more constraints
  - Existing development or property lines
  - Topgraphy, wetlands, or other unusual site conditions
- There must be no feasible alternative
- Board must find that there is no adverse impact on adjacent land or traffic safety
- Separation must be at least the minimum opposite-side offset in order to avoid traffic conflicts

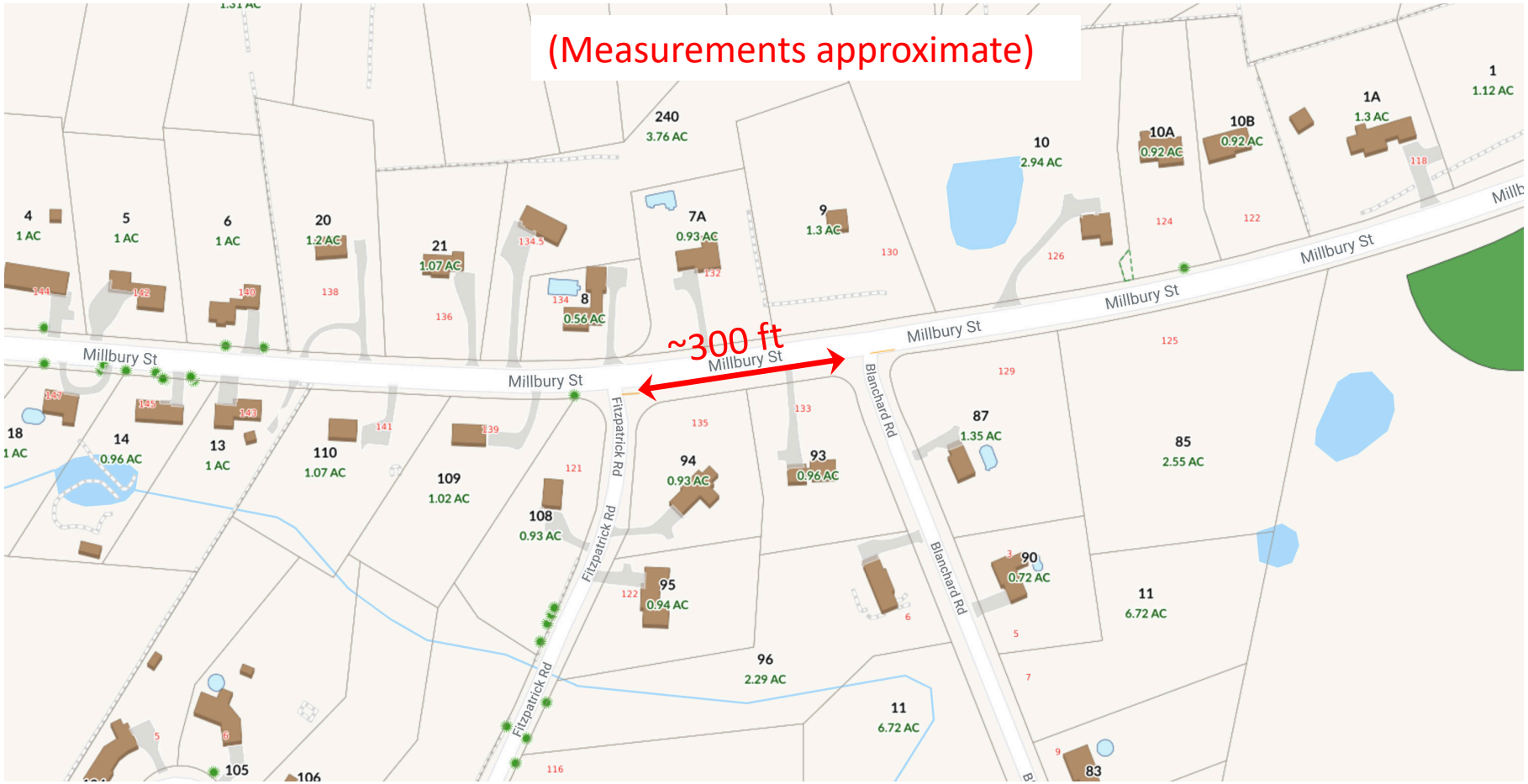
Streets on Three Sides of a Developed Residential Lot are Generally Unacceptable

May Allow Reduced Separation Around Open Space

Same-Side Separation Example: Woodside Dr between Westview St and Crescent St



Same-Side Separation Example: Millbury St between Fitzpatrick Rd and Blanchard Rd



Congestion at Intersections

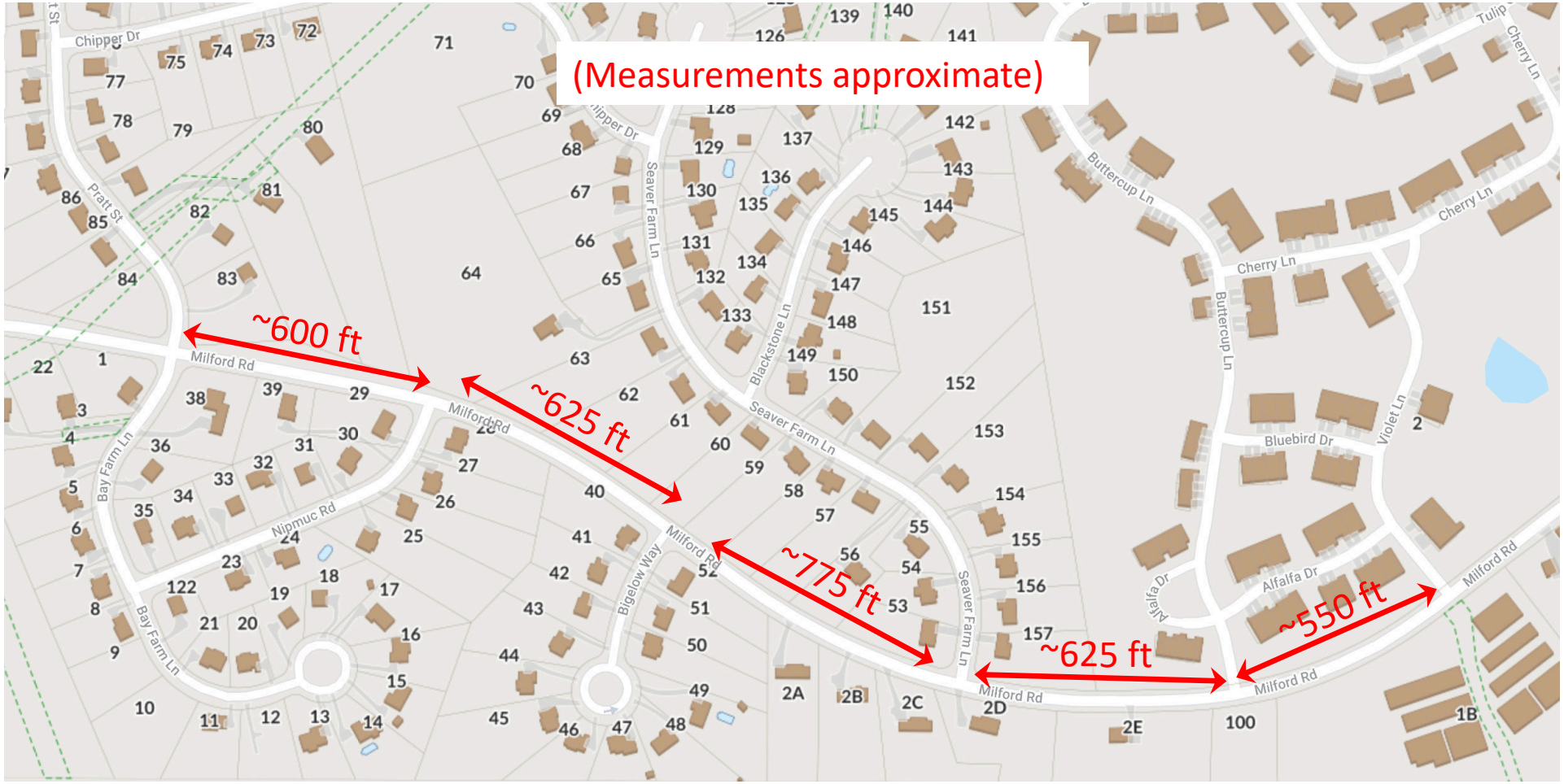
Congestion at intersections becomes a problem on busy streets

- Major street = 1,500 or more vehicles per day
- Higher traffic volume results in more congestion at intersections due to vehicles entering or leaving the street
- Congestion is compounded when intersections are closer together

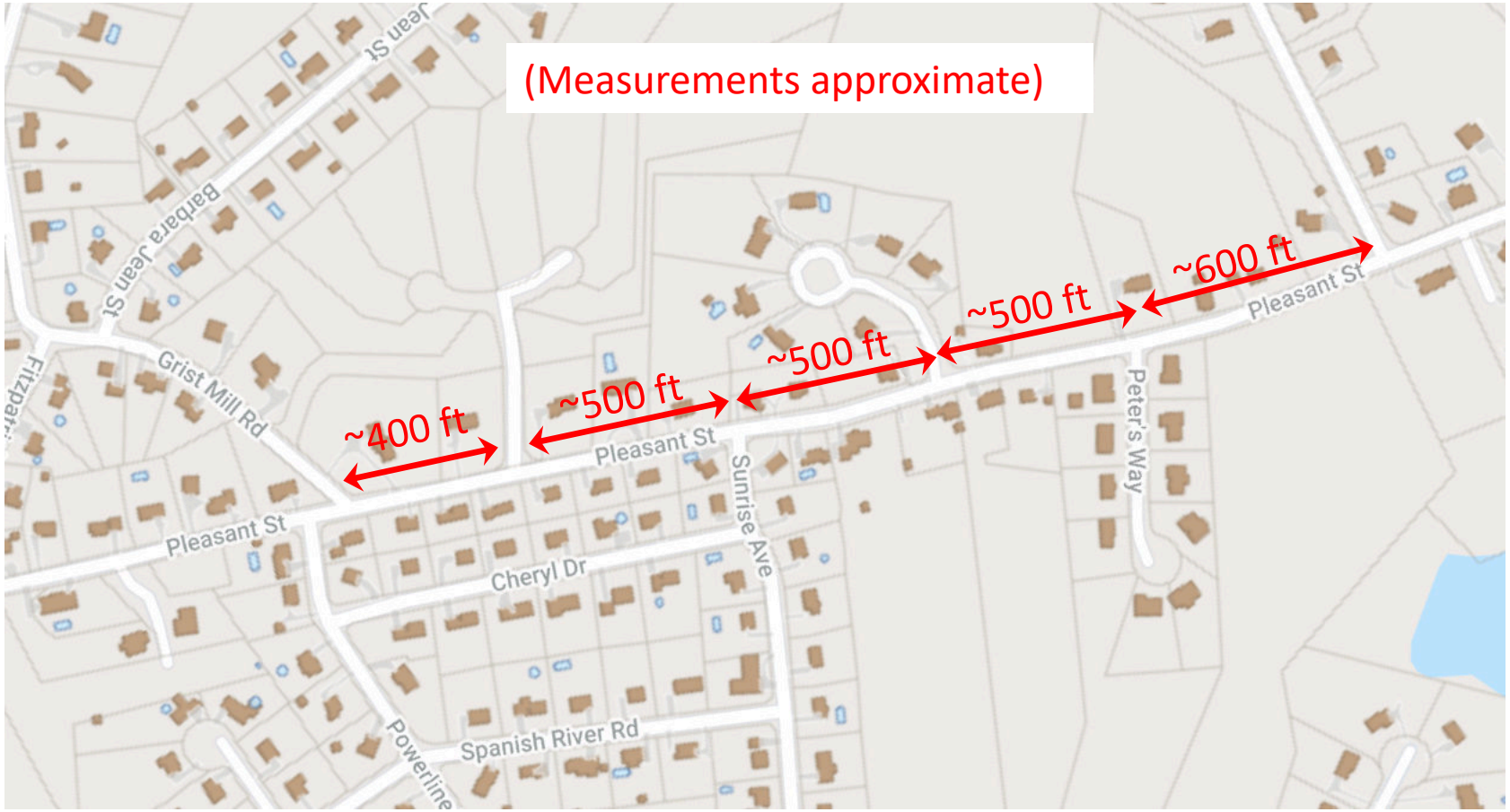
Limit congestion by requiring intersections on major streets, regardless of which side of the major street the side street is on, to be separated by a suitable minimum distance

“Suitable minimum distance” is very subjective; there seem to be no objective metrics – examples of various separations follow

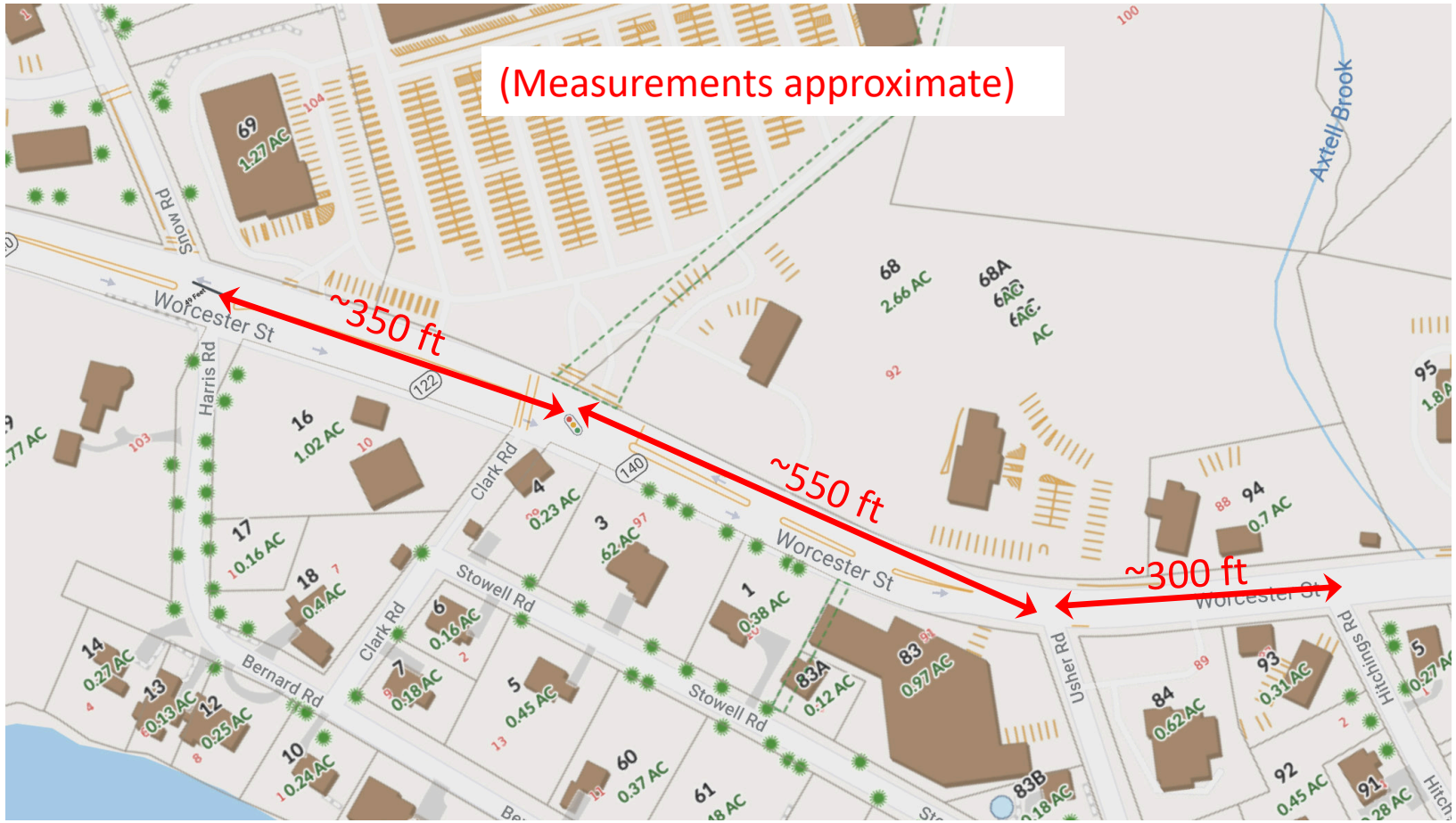
Major Street Intersection Separation Example: Milford Rd, 600’ separation



Major Street Intersection Separation Example: Pleasant St, 500’ separation



Major Street Intersection Separation Example: Worcester St, 300’ separation



Intersection Separation: Proposed Rules

4.1.3.6 Streets entering opposite sides of another street shall be directly opposite one another or shall have an opposite-side offset of at least 150 feet between their centerlines. Streets entering the same side of another street shall have a minimum same-side separation between their rights of way of twice the minimum frontage for the applicable zoning district or 250 feet, whichever is greater. Notwithstanding the foregoing, intersections on a Major Street shall be separated by a minimum of 500 feet between their centerlines. In cases where constraints imposed by existing development or property lines, topography, wetlands, or other unusual site conditions make it infeasible to satisfy the minimum separation between two streets and no feasible alternative designs are possible, the Planning Board may waive the minimum separation requirement, provided that the centerlines of the two streets are separated by at least the minimum opposite-side offset and that the Planning Board finds that the reduced separation will not have an adverse impact on traffic safety or on the land between the two streets. In special instances the Planning Board may approve a right-of-way for a future street to remain in fee ownership of the applicant, in lieu of actual construction of a cross street.